

REMARKS

Reconsideration of the objection and the rejections set forth in the Office Action dated June 10, 2004, is respectfully requested. In the Office Action, the Examiner rejected claims 1-25. Applicant has cancelled claims 1-25 and has added new claims 26-107. Accordingly, claims 26-107 are pending in the application. No new matter has been added by these amendments as can be confirmed by the Examiner.

A. Information Disclosure Statement

The Examiner commented that Applicant must provide an Information Disclosure Statement on a form PTO-1449 prior to, or concurrent with, the present Amendment in response to the June 10, 2004, Office Action.

On May 28, 2004, Applicant filed an Information Disclosure Statement with a four-page form PTO-1449 that listed forty-one references. Applicant also provided copies of eight non-patent references as identified in the Information Disclosure Statement. Copies of the Information Disclosure Statement, the four-page form PTO-1449, and the eight non-patent references have been included herewith for the convenience of the Examiner.

B. Isozaki Does Not Disclose or Suggest a Measurement of a Three-Dimensional Structure Formed on, and Inherent to, a Preselected Region on a Surface of a Specimen in Accordance with Claims 26-107.

In the Office Action, the Examiner rejected claims 1-3, 7, 10, 12, 14, 18-20, 23, and 24 under 35 U.S.C. § 102(b) as allegedly being anticipated by Isozaki, United States Patent No. 6,115,117. Applicant respectfully traverses this rejection. By failing to disclose each and every claim element, Isozaki does not anticipate new independent claims 26, 38, 47, 55, 66, 83, and 96. Therefore, it is submitted that new independent claims 26, 38, 47, 55, 66, 83, and 96, as well as new claims 27-37, 39-46, 48-54, 56-65, 67-82, 84-95, and 97-107 that respectively depend thereon, are in condition for allowance.

As recognized by the Examiner, Isozaki discloses a surface inspection system for optically scanning an entire surface of a semiconductor wafer and for detecting the presence and position of foreign matter disposed thereon. (See June 10, 2004, Office Action at p. 3.) The disclosed surface inspection system includes an optical system 112 for providing a light beam onto the surface of a wafer 111 and first and second light receiving optical systems 113, 115. (See Isozaki at Fig. 1; col. 2, ll. 60-67; col. 3., ll. 1-5.) **The first light receiving optical system 113 receives a scattered light beam reflected from foreign matter on the surface of the wafer 111** and provides a first sensed-light signal; whereas, the second light receiving optical system 115 receives and condenses a light beam reflected by mirror reflection from the surface of the wafer 111. (See id.) An output signal from the second light receiving optical system 115 is disclosed as indicating a position of the reflected light beam following a change in the height of the surface of the wafer 111. (See id. at col. 3., ll. 19-21.)

Isozaki further discloses that the wafer 111 is supported and displaced by a **spiral scanning system**. (See id. at Fig. 1; col. 3., ll. 5-18.) The spiral scanning system includes a linear displacement portion 117 for **linearly displacing the wafer 111 and** a rotational displacement portion 118 for **rotationally displacing the wafer 111 relative to the fixed irradiating optical system 112 and the fixed first and second light receiving optical systems 113 and 115.** (See id.) Thereby, the surface inspection system as taught by Isozaki permits the light beam from the surface optical system 112 to make **a spiral scan of the entire surface of the wafer 111 to detect the presence of foreign matter.** (See id. at Fig. 1; col. 1., ll. 28-32; col. 3., ll. 5-18.)

In Isozaki, during the spiral scan of the entire surface of the wafer 111, the output signal from the second light receiving optical system 115 is provided to a height detecting circuit such that the height of the surface of the wafer 111 is constantly measured. (See id. at col. 3, ll. 32-36, 57-58.) When foreign matter is detected, the

height of the wafer surface is determined, and a position coordinate of the foreign matter is corrected by adjusting the position coordinate to compensate for changes in the height of the wafer surface. (See *id.* at col. 3, ll. 57-67.) The position coordinate of the foreign matter thereby is corrected to account for any warpage in the surface of the wafer 111. (See *id.* at col. 4, ll. 1-8.)

In contrast to the inspection system taught by Isozaki, the newly presented claims are direct to a metrology apparatus, system, and method for measuring three-dimensional structures formed on a surface of a specimen. **The structures measured by the claimed metrology system and method are formed on the surface and inherent to the specimen, such as conductor lines formed on the surface of a semiconductor wafer, rather than extrinsic “foreign matter” disposed on the surface. Applicant’s metrology system and method, as claimed, likewise measures a dimension of the three-dimensional structures;” whereas, Isozaki’s inspection system merely detects the presence and position of the foreign matter.** While disclosing that the height of the surface of the wafer is constantly measured, Isozaki does not disclose, or even suggest, that the inspection system can measure any dimension of the foreign matter.

Further, the metrology apparatus, system, and method, as claimed, recite **the measurement of structures formed within preselected regions of the surface of the specimen.** In particular, the claimed metrology system and method set forth: “a beam-formation system for ... directing [a] beam of ... electromagnetic energy toward a preselected region on the surface of the specimen,” “an energy-collection system for receiving at least a portion of said beam of ... electromagnetic energy scattered from a three-dimensional structure formed on the surface within the preselected region.” The beam-formation system and the energy-collection system then are rotated “about a rotation axis perpendicular to the surface of the specimen and centrally intersecting the preselected region.”

The beam-formation system and the energy-collection system as claimed in the present application neither undergo translation while measuring the structures formed within the preselected regions nor scan the entire surface of the specimen. In contrast, Isozaki teaches the opposite in that the inspection system is disclosed therein as making a **spiral scan of the entire surface of the wafer to detect the presence of foreign matter**. As discussed above, the inspection system as taught by Isozaki includes a **spiral scanning system for linearly and rotationally displacing the wafer relative to the fixed irradiating optical system and the fixed first and second light receiving optical systems** to make a **spiral scan of the entire surface** of the wafer.

At least one recited element of new independent claims 26, 38, 47, 55, 66, 83, and 96 therefore is totally missing from Isozaki. In accordance with M.P.E.P. § 2131, “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). The disclosure of a claim element in a prior art reference, when relied upon to negate patentability, must also be clear and unambiguous. Further, “[t]he identical invention must be shown in as complete detail as contained in the...claim.” *Richardson v. Suzuki Motor Corp.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). Furthermore, and uniquely important in this case is the requirement that the elements relied on in the prior art reference must be arranged as required by the claim. See *In re Bonds*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990).

According, since Isozaki fails to disclose each and every element of new independent claims 26, 38, 47, 55, 66, 83, and 96, Isozaki does not anticipate claims 26-107. Therefore, it is submitted that claims 26-107 are in condition for allowance.

C. No Motivation Exists to Modify the Teachings of Isozaki in a Manner that Precludes the Patentability of New Claims 26-107 Under 35 U.S.C. § 103(a)

The Examiner also rejected claims 4-6, 8, 9, 13, 21, and 22 under 35 U.S.C. § 103(a) as allegedly being rendered obvious by Isozaki, either alone or in view of McNeil et al., United States Patent No. 5,867,276, or Rangarajan et al., United States Patent No. 6,556,303. In accordance with M.P.E.P. § 2142, the Examiner bears the initial burden of establishing a *prima facie* case of obviousness. "To establish a *prima facie* case of obviousness, three basic criteria must be met." (M.P.E.P. § 2143.) First, some suggestion or motivation in the prior art references or in the knowledge of one of ordinary skill in the relevant art must exist to modify or combine the references. Second, if the references are combined, a reasonable expectation of success must be shown. Then, finally, all of the claim limitations must be taught or suggested by one reference or a combination of references. To establish a *prima facie* case of obviousness based on a single reference that does not teach all the elements of a claim, the Examiner must provide a rationale for modifying the teachings of the reference. See *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000), *citing*, *B.F. Goodrich Co. v. Aircraft Breaking Sys. Corp.*, 72 F.3d 1577, 1582, 37 U.S.P.Q.2d 1314, 1318 (Fed. Cir. 1996).

As set forth in more detail above, Isozaki discloses a surface inspection system for optically scanning the entire surface of a semiconductor wafer and for detecting the presence and position of foreign matter disposed thereon. In fact, Isozaki "teaches away" from making measurements in preselected regions on the surface of a specimen by disclosing that the inspection system makes **a spiral scan of the entire surface of the wafer to detect the presence of foreign matter**. No incentive thus exists for a person having ordinary skill in the art to look to Isozaki.

Furthermore, the Examiner does not assert that any teaching or motivation exists in the prior art to modify Isozaki in a manner that renders obvious new claims 26-107.

First, the Examiner has not established a *prima facie* case under 35 U.S.C. § 103 because, as shown above, Isozaki fails to disclose all of the elements of the pending claims. Second, Isozaki does not provide the motivation to modify the disclosed surface inspection system to measure three-dimensional structures formed on, and inherent to, a preselected region on a surface of a specimen as recited in new independent claims 26, 38, 47, 55, 66, 83, and 96. Accordingly, Isozaki does not render new claims 26, 38, 47, 55, 66, 83, and 96 obvious; therefore, claims 26-107 are in condition for allowance.

For at least the reasons set forth above, it is submitted that claims 26-107 are in condition for allowance. A Notice of Allowance is earnestly solicited. The Examiner is encouraged to contact the undersigned at (949) 567-6700 if there is any way to expedite the prosecution of the present application.

Respectfully submitted,

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